

likely to produce acceptable values, which may, however, be multiples or submultiples of the true values.

The intensity of the Meudon spectrograms about the region λ 393 is not sufficient to confirm, or refute, the observation of Prof. Hartmann that the "K" (calcium) line does not appear to share in the periodic displacements of the other lines in the spectrum.

THE SOLAR SURFACE DURING 1903.—The annual report of the observations of solar phenomena made at the Lyons Observatory during 1903 appears in the August number of the *Bulletin de la Société astronomique de France*, wherein M. J. Guillaume gives comparative tables showing the numbers, areas, and distribution of spots and faculae for the years 1900–1903 inclusive.

Of the 260 observing days in 1903 there were only thirty-eight on which "no spots" was recorded. Both the numbers and areas of spots show a marked increase on the previous year, the figures being 1902, 33 and 1785 millionths, and 1903, 115 and 8440 millionths. The mean latitude, for both hemispheres, during 1903 was $10^{\circ}3'$, in place of $15^{\circ}9'$ and $21^{\circ}2'$ for 1901 and 1902 respectively.

The groups of faculae were fewer in number during 1903 than in 1902 (324 and 363 respectively), but their total area was a little more than twice as great (204.1 and 97.6 thousandths respectively), whilst their mean latitude was $27^{\circ}8'$, as compared with $38^{\circ}8'$ in 1902, and $35^{\circ}8'$ in 1901.

The preponderance of spots in the northern hemisphere remarked in 1901 and 1902 changed over to the southern hemisphere in 1903, the total areas during last year being S. 507.1 millionths, N. 336.9 millionths.

From the tables showing their distribution in latitude and longitude, one sees that the greatest augmentations of both spots and faculae, in each hemisphere, took place in the same zones.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Dr. Wm. Osler, F.R.S., has, with the King's approval, been appointed regius professor of medicine in succession to Sir John Burdon Sanderson, Bart., F.R.S. Prof. Osler has, since 1889, filled the chair of the principles and practice of medicine at Johns Hopkins University, Baltimore.

CAMBRIDGE.—In connection with the visit of the British Association, the degree of Doctor of Science, *honoris causa*, will on August 22 be conferred on the following:—J. O. Backlund, director of the Pulkova Observatory; Prof. H. Becquerel, Paris; Prof. J. W. Brühl, Heidelberg; Prof. A. Engler, Berlin; Prof. P. H. von Groth, Munich; P. Kabbadias, Athens; Prof. A. Kossel, Heidelberg; Prof. H. F. Osborn, New York; N. G. Pierson, Amsterdam; Prof. V. Volterra, Rome; Sir David Gill, K.C.B., F.R.S.; A. W. Howitt, the Australian anthropologist; Sir Norman Lockyer, K.C.B., F.R.S.; Major P. A. MacMahon, F.R.S.; Sir W. Ramsay, K.C.B., F.R.S.; Prof. A. Schuster, F.R.S.; Sir W. T. Thiselton-Dyer, K.C.M.G., F.R.S.

The first list of successful candidates for the university diploma in tropical medicine and hygiene has just been issued by the examiners (Sir P. Manson, Major Ross, and Dr. Nuttall). It includes the following:—A. R. Cleveland, A. R. J. Douglas, G. Elliott, P. N. Gerrard, C. M. Heanley, J. C. B. Satham, C. A. Suvoong, and J. C. Thompson.

Mr. S. A. McDowall, Trinity, has been appointed assistant to the superintendent of the Museum of Zoology (Dr. S. F. Harmer).

DR. ALBERT S. GRUNBAUM, lecturer in experimental medicine at the University of Liverpool, and director of cancer research at Liverpool, has been appointed professor of pathology and bacteriology in the University of Leeds in the place of Prof. Trevelyan, who is retiring. Dr. George Wilson has been appointed to the newly created lectureship in civil engineering in the same university.

THE syllabus for 1904–5 of the Redruth School of Mines shows that a successful local effort is being made to provide practical scientific training in mining to those engaged in this important Cornish industry. The main object of the School of Mines is to provide theoretical and practical in-

struction in mining and the allied subjects essential to the training of competent mining engineers. The training in practical mining is given at the Basset Mines and at other mines in the locality, under the general supervision of an instructor. The practical underground work includes the timbering of shafts and levels. Students are taught, in addition, the methods of prospecting for minerals in all positions, and are trained to detect favourable indications on the surface. They are shown by examples in the neighbourhood how to *costean* for lodes, and how to detect the effect of cross-courses and slides on the lodes. The differences between fissure veins, gash veins, and contact lodes are pointed out by examples; the manner in which the lodes are affected by passing through the different strata, and the effect the bearing of the lode has on its productiveness in certain districts. Studies are made of the maps of the neighbourhood, and opportunities afforded for examination of other mines now working, and for investigating, as far as possible, those that have been abandoned.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, July 25.—M. Mascart in the chair.—On a functional equation: Emile Picard.—Chemical and geological study of some springs in the north of Madagascar: Georges Lemoine and Paul Lemoine.—On some facts relating to the observation of variations in the lustre of phosphorescent sulphides under the action of *n*-rays or analogous phenomena: E. Bichat.—The academy was invited to send delegates to the second International Botanical Congress at Vienna, to be held from June 12 to 18, 1905.—On a relation between the minima and maxima of sun-spots: Alfred Angot.—On the singularities of the equation

$$y' = A_0 + A_1y + A_2y^2 + A_3y^3 :$$

Pierre Bouteux.—On the absorption of gases by wood charcoal at low temperatures: Sir James Dewar.—The liquid air calorimeter is used to determine the heat liberated by the absorption of certain gases in charcoal, the volume absorbed being measured. With all gases except helium, the volume absorbed is greatly increased by low temperature. Absorption of gases with charcoal at low temperatures forms a good method of producing a vacuum.—On the nature of *n* and *n*₁ radiations, and on the radio-activity of the bodies which emit these radiations: J. Becquerel.—On the refraction of *n*- and *n*₁-rays: J. Becquerel.—On the contemplation in a dark room of surfaces feebly illuminated by certain special lights. The case of objects of linear form: F. P. Le Roux.—The phenomena of magnetic viscosity in soft industrial steels, and their influence on the methods of measurement: Raymond Jouaust.—Magnetic exploration of the Gulf of Padirac: E. Mathias.—On the earthquake of July 13, 1904, in the central Pyrenees: E. Marchand.—On the discharge of electricity in the air at the summit of the Eiffel Tower during the storm of July 24: A. B. Chauveau.—On the form taken by thallos iodide on being deposited from solution: D. Gernez.—On radio-active lead, radio-tellurium, and polonium: A. Debierne.—Action of zinc on the tungstates of sodium: L. A. Hallopeau.—On the acid pyrophosphate of silver: J. Cavalier.—On the composition of the homologues of Schweinfurt green: Georges Viard.—The heat of formation of the trisulphides of antimony: MM. Guinchant and Chrétien.—On polishing and connected scientific phenomena: F. Osmond and G. Cartaud.—On vinylidimethylacetic acid: E. E. Blaise and A. Courtot.— β -Oxyalkyl and β -oxyphenyl ethylene ketones. The action of hydroxylamine and phenylhydrazine: Ch. Moureu and M. Brachin.—The action of oxalacetic ether on aromatic aldehydes in the presence of β -naphthylamine: L. J. Simon and A. Conduché.—The action of acid chlorides on tertiary bases with an aromatic nucleus: V. Auger.—On the general arrangement of the nervous system in *Rissoa elata*, var. *oblonga* (Desmaret): G. Quintaret.—On the intracellular contents of the parenchyma of certain fruits: Wladimir Tichomirov.—On the anatomy of the tubers of *Euphorbia Intisy*: Marcel Dubard and Rene Viguiet.—Contribution to the study of blight in tobacco leaves: MM. Bouygues and Perreau.—Researches on the

mechanism of respiratory combustion. The production of citric acid by *citromyces*: P. Mazé and A. Perrier.—On the law of Bravais and the reticular hypothesis: G. Friedel.—On the lode of heavy spar called "la Chandelette," near Villefort: Marcel Guédras.—On the evolution of the zone of sub-Carpathian depressions in Roumania: E. de Martonne.—The relation between seismic phenomena and the geological age of a chain or region: M. de Montessus de Ballore.—On the property possessed by certain portions of the human body of continually giving out a ponderable emanation: Julien Meyer.—New facts on the rôle of the nervous system in the function of the heart: Jean Dogiel and K. Arkanguelsky.—Toxic substances extracted from the eggs of the tortoise and of the hen: Gustave Loisel.—Researches on the poison of bees: C. Phisalix.—On the bactericidal properties of the secretions of parasitic worms: L. Jammes and H. Mandoul.—On the infectious nature of the anæmia of the horse: MM. Vallée and Carré.

August 8.—M. Mascart in the chair.—On the changes of curvature exhibited by the air bubble in spirit levels, under the influence of temperature variations: G. Bigourdan. A particular level, used on a telescope mounting, showed considerable variations in its constant with temperature. This was traced to the effect of the expansion of the metallic tube in which it was mounted, and the conclusion is drawn that for work of precision it is necessary to reject this form of mounting, and to use instead a nickel steel possessing an expansion equal to that of the glass.—The general equations of motion of sheets of water infiltrated through the soil: J. Boussinesq. A continuation of a previous paper on the same subject. Certain restrictions laid down in the first note are removed, and the results worked out to a higher degree of approximation.—On some results recently obtained by metrophotography: A. Laussedat. Some additional results obtained with the apparatus of Pulfrich by the method of parallaxes. In the Tyrol, two photographs, with a base of 254 metres, have proved sufficient to construct the greater part of a map of the district on the scale of 1/25,000, including mountains of a height of more than 3000 metres, and 8 kilometres distance from the base. The apparatus has also been successfully applied in Canada.—On the use of a movable reference tetrahedron in the geometry of Cayley: A. Demoulin.—On groups of the order p^m , of which all the subgroups p^{m-2} are Abelian: M. Potron.—On a theorem of M. Borel in the theory of integral functions: M. Rémondos.—On the loss of electricity in the air observed at the summit of the Eiffel Tower during the storm of August 4: A. B. Chauveau.—The theory of dilute solutions, based on the law of van 't Hoff: E. Aries.—On the permanence of crystalline forms in crystals: F. Osmond and G. Cartaud.—New researches on vanadium steels: Léon Guillet. Normal vanadium steels are not more fragile than ordinary steels containing the same percentage of carbon. They are very sensitive to thermal and mechanical treatment.—On some derivatives of pentabasic phosphoric acid: P. Lemoult.—On dimethylpyroarsenic acid: E. Baud.—On the existence of alkaline rocks in Central Africa: Louis Gentil.

NEW SOUTH WALES.

Linnean Society, June 29.—Dr. T. Storie Dixon, president, in the chair.—Descriptions of Australian Microlepidoptera, xviii., Gelechiadæ: E. Meyrick, F.R.S. This family forms a smaller proportion of the Tineina in the Australian region than it does in Europe, amounting, perhaps, to about 12 per cent. of the whole. As, however, the species are often retired in habit, small, inconspicuous, and rather difficult to study, they have been much neglected, and may perhaps prove eventually to be more relatively numerous than they seem at present. Fortunately only seven species were known to Walker, others assigned by him to this family being wrongly attributed. Mr. O. Lower has in late years described some number; he has very kindly transmitted specimens of all these (frequently the actual types) for examination, so that the author has been able to ascertain positively their identity in all cases; this assistance has been most valuable. Much material in specimens and notes of localities has also been received from him, as

well as from Mr. G. Lyell, the late Mr. G. Barnard, and other collectors whose records are duly acknowledged in their place. Altogether 274 species are here recorded, of which 207 are now described as new. Of this total, 85 species, or not much less than a third, are included in the endemic genus *Protolechia*, but no other strictly endemic genus attains any large size, though 40 out of the 55 genera are endemic, so far as is known.—A variable galactan bacterium: Dr. R. Greig Smith. A bacterium isolated from the tissues of a species of *Strychnos* grew on gelatin as brittle moruloid colonies which contained an insoluble gum. Cultivation at 30° C. caused the organism rapidly to lose the faculty of forming this insoluble gum. A soluble gum was produced instead, and the colonies in consequence became gummy and otherwise uncharacteristic. The gums from both forms of bacteria were galactans, and differed only in solubility.—The red string of the sugar-cane: Dr. R. Greig Smith. Instances of the vascular strings of the sugar-cane being coloured a deep red from the presence of a red gum in the large vessels have been recorded in connection with certain diseases, such as sereh, the sugar-cane disease of Massee, the pine-apple disease of the cane, and red smut (red rot), in all of which it has been denied that bacteria produce the gum. The cases of red string investigated by the author occurred in apparently healthy plants, and also in canes affected with gummosis. The gum was produced by *Bacillus pseudarabius*, n.sp., and the crimson colour was imparted to it by a mould. The co-existence of the two is essential for the production of the colour in the vessels of the sugar-cane. Both organisms are described in detail. The gum gave the reactions for arabin, but as it hydrolysed to galactose only it was a galactan.

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